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⑤ **Dispensing device.**

⑤ A device for dispensing detergent or other laundry treatment tablets (5) in a washing machine is a sleeve (2) of elastic material, able to conform tightly to the tablets, and having holes (4) for water flow. Such a device inhibits the tablets from lodging where they should not, such as at the door of a front loading automatic machine.

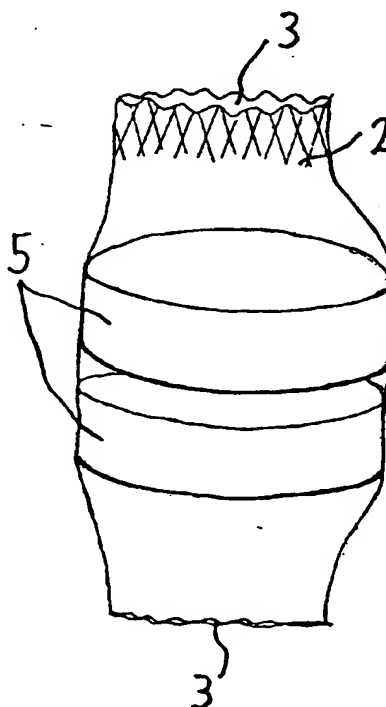


Fig. 2

EP 0 576 234 A1

TECHNICAL FIELD

This invention relates to a device for dispensing detergent or other laundry treatment tablets into the wash liquor within the drum of a washing automatic machine.

BACKGROUND AND PRIOR ART

There have been a number of previous proposals for the treatment of laundry in a washing machine in which a detergent or other composition with which the laundry is to be treated is placed in a dispensing device and the device placed in the machine together with the laundry before the operation of the machine is begun. The use of such dispensing devices can be useful in the washing of laundry with both liquid detergent and solid detergent such as in powdered, granular, flake or particulate form particularly when the compositions are difficult to dispense by means of automatic dosing systems incorporated into the washing machine or, even if they can be automatically dispensed by such automatic dosing systems, the dosing systems and the design of the washing machine are such that a proportion of the detergent composition flows to dead areas of the machine and is not fully drawn into the wash liquor in contact with the laundry.

It is of course necessary for the detergent composition to be dispensed from such a dispensing device at the commencement, or shortly after the commencement, of the washing cycle of the machine in order to maximise the exposure of the laundry to wash liquor containing the detergent composition. This is particularly important when the wash cycle time of the machine is relatively short.

Examples of dispensing devices for use in the washing of laundry in washing machines with a particulate detergent are proposed in EP 340 069 A (Procter & Gamble) and EP 343 070 A (Procter & Gamble). EP 343 069 A discloses a reusable receptacle for dispensing a detergent in powder or tablet form. The receptacle is a flexible bag-like body with a closable opening. In use the receptacle is filled with detergent powder, the receptacle is then closed and placed in the washing machine with the laundry, and a normal wash programme is followed.

EP 343 070 A discloses an essentially flexible bag-shaped sleeve having a mouth attached to a rigid ring member which maintains the mouth of the bag open during the wash. In certain embodiments disclosed in EP 343 070 A, the bag is made from material which allows the aqueous washing solution to penetrate through the bag but which is capable of retaining the particulate product while it is still solid. A disadvantage is that the ring around the outside of the mouth of the bag presents an edge which in use can damage delicate laundry, particularly when used in a front-loading washing machine i.e. one having a drum rotatable about a horizontal axis.

A dispensing device designed specifically for detergents in tablet form is disclosed in EP 473 532 A (Viking Industries Ltd). The device has a flexible bag-like body, and within the bag-like body is a freely movable member which aids disintegration of the tablet during the wash cycle. Disintegration is aided during the wash cycle by the wash load compressing the flexible body of the bag thus pressing the tablets against the freely movable member and so causing the tablets to disintegrate.

A disadvantage of tablets is that they have a tendency, during the wash cycle, to lodge between the door and the drum of front loading washing machines. This problem is exacerbated by the door design in some makes of washing machine.

Placing the tablets in a flexible bag does not mitigate the problem of lodging as the tablet can still become trapped in the door of the machine within the bag.

Accordingly an object of the present invention is a dispensing device for tablets which achieves satisfactory dispensing and tablet disintegration and also overcomes the problem of lodging.

DEFINITION OF THE INVENTION

The present invention provides a device for dispensing one or more laundry treatment tablets in a washing machine, especially in a front-loading automatic washing machine, which device comprises a sleeve of elastic material, the sleeve when stretched being capable of conforming tightly to the tablet(s) and having holes which in the stretched state are sufficiently large to allow water flow therethrough.

The device can serve to inhibit the lodging of tablets in undesired locations such as at the door of a front loading automatic washing machine.

The invention also provides a method of treating fabrics in an automatic washing machine which comprises placing in with the fabrics laundry treatment tablets enclosed in a dispensing device comprising a sleeve of elastic material, the sleeve when stretched being capable of conforming tightly to the tablet(s) and having holes which in the stretched state are sufficiently large to allow water flow therethrough.

DETAILED DESCRIPTION OF THE INVENTION

The device of the invention is for dispensing at least one detergent or laundry treatment tablet. As an essential feature the device comprises a sleeve having elastic properties so that it is capable of conforming tightly to the tablet and it must when thus conformed to the tablet allow water to pass thereto.

Advantageously the device can have a degree of rigidity sufficient to stop the device lodging in the door when only one tablet is present. The rigidity also hinders the tablets from lodging when two or more tablets are present.

However, this degree of rigidity is not essential when two or more tablets are present as the ability of the device to conform to the shape of the tablets and thus hold them tightly stacked together produces a rigid object sufficiently large to prevent lodging.

However, in a preferred embodiment of the invention a minimum degree of rigidity is desired to prevent or substantially reduce the empty device from "posting" i.e. passing between the inner and outer drums of the washing machine and becoming trapped there.

The shape of the device is such that it can enclose and support the tablets. As most tablets normally have a cylindrical shape, the device conveniently has a cylindrical shape and substantially constant cross section, as this shape would most efficiently support the tablets. If however a differently shaped tablet were used the shape of the device could, if necessary, be adapted so it could also support these tablets in the most efficient manner. However, a sufficiently flexible material can conform to a variety of shapes.

The length of the device is preferably that of at least two tablets. The preferred range for the length of the device when it conforms to a cylindrical shape is from 6cm to 30cm, more preferred 8cm to 22cm, most preferred 12cm to 18cm. The diameter of the device is such that it can support the tablet by expanding to allow insertion of the tablet into the device then retracting to conform tightly to the sides of the tablet. Naturally this in turn depends on the elasticity of the material. A device which is made from a material with very good elastic properties can have a narrower diameter when no tablets are inserted than a device which is made from a material in which the elastic properties are not so good. A typical material envisaged for use in this invention would allow the device to have a diameter within the preferred range of 1cm to 6cm when empty and to expand to support a tablet with a diameter of 2.5cm to 9.5 cm. More preferably the diameter of the device could be within a range of 2.5cm to 4cm when empty and could expand to support a tablet with a diameter of 3.5cm to 5.5 cm.

The device must allow water to flow to the tablet, hence it must have holes or pores. According to a highly preferred embodiment the device is a mesh network. The mesh network should be designed so it is expansible in width allowing the insertion of a tablet but relatively rigid in length so that the tablet cannot easily escape from the device during the wash cycle. This requirement is met by a mesh having diamond shaped holes in which the longer dimension of the diamonds is parallel to the longitudinal axis of the device, however it is envisaged that other mesh types could also provide the required properties.

The holes of the mesh should be of a size sufficient to allow the flow of water to the tablet but not so big as not to provide adequate support for the tablet.

When the mesh has diamond shaped holes the size of the diamonds when no tablets are inserted preferably have a length of from 0.1 cm to 2.0 cm and a width of from 0.1 cm to 2.0 cm.

The device can be fabricated from any water insoluble elastic sheet material such as woven cloth, rubber or preferably plastics. Preferred materials are water-insoluble elastic polymeric or polymer composite materials. A specially preferred material is a flexible plastic mesh such as "NETLON" (trade mark) supplied by Netlon Ltd, UK which is typically made of a low density polyethylene/ polyethylene-vinylacetate copolymer blend and has diamond-shaped holes.

One possible embodiment of the invention is a sleeve sealed at one end. If the sleeve is of thermoplastic material one end can be sealed by means of a heat seal.

The device has one or more openings through which the tablets are inserted. An optional feature is that the openings can have closure means, although this is not essential because with some materials the elasticity will naturally cause the openings to close sufficiently to retain the tablet. Examples of the types of closure means envisaged are firstly a mouth attached to the opening, the mouth having two lips, made from a flexible material. When the ends of the lips are compressed they bend and open the mouth, when the centre of the lips are compressed together they close the mouth. A second closing means is a moulded plastic strip (attached to half of the opening of the device) with a central groove, a corresponding strip of plastic (attached to the other half of the opening of the device) has a central flange that can slot into the groove, thus closing the opening.

When the device is formed from the preferred mesh, it may be desirable to provide a smooth edging to the mesh at each end of the sleeve, or at the operable end if one end is permanently closed. This can reduce

the likelihood of the device snagging laundry.

TABLETS TO BE USED IN CONNECTION WITH THE DEVICE

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The device of the invention may be used to dispense any laundry treatment product in tablet form.

Examples of such treatment products are bleaching compositions, conditioning compositions and, especially, detergent compositions.

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Tablet detergent compositions may generally comprise detergent-active compounds, detergency builders, a bleach system, optical brighteners, antifoam ingredients and other optional ingredients. Examples of detergent tablets are described in EP 466 484 A and EP 395 333 A (Unilever).

Preferred tablet formulation for use with the device should be capable of rapid disintegration in the wash liquor. Advantageously the formulations may contain binder/disintegrants as described in our copending European Patent Application No 92 306005.7.

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The tablets for use with the invention are suitably prepared by compaction of a particulate starting material. Any suitable tableting apparatus may be used.

The size of the tablet for use with the device will suitably range from 10 to 160 g, preferably from 15 to 60 g, depending on the wash conditions under which it is intended to be used, and whether it represents a single dose, a multiple dose or a submultiple dose.

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The tablet may be of any suitable shape, but for manufacturing and packaging convenience is preferably of uniform cross-section, for example, circular (preferred) or rectangular.

Description of the Drawings

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The invention will now be described in further detail, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a device in accordance with the invention;

Figure 2 is a similar view of the device, now containing two tablets. This figure shows the outline of the sleeve, and the tablets within, but does not show completely the mesh of the sleeve.

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Referring now to the figures of the accompanying drawings, a dispensing device 1 is in the form of a sleeve 2 of substantially constant cross section, with two openings 3 positioned longitudinally at the ends of the sleeve. The sleeve is a plastics mesh in which the holes 4 are in the shape of diamonds, the longer dimension of the diamonds being parallel to the longitudinal axis of the device. Tablets 5 when placed in the device are held tightly stacked together as the device conforms tightly to the tablets' shape.

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In use the tablets are inserted through one opening into the device. The arrangement of the diamond shaped holes is such that the longer dimension of the diamonds being parallel to the longitudinal axis of the device, and thus causes the device to easily expand in width to accommodate the tablets, but to remain relatively rigid in length so that the tablets are supported and can not easily fall out through the openings. The device containing the tablets is placed with the wash load into the drum of a washing machine and a normal washing cycle is followed,

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Examples

The following examples used cylindrical tablets of height 17mm, diameter 53mm, weight 45g, formed by compaction of powder having the following formulation:

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	Percentage
Sodium alkyl benzene sulphonate	9.6
Nonionic surfactant	11.2
Sodium stearate	2.6
Zeolite	38.2
Polyacrylate	6.4
Sodium silicate	0.7
Sodium carbonate	12.9
Sodium carboxymethylcellulose	0.8
Fluorescer	0.3
EDTA	0.3
Moisture and salts	17.0

Example 1

Two cylindrical tablets were placed inside a plastics mesh (Netlon-(TM)) sleeve, as described above, of diameter 5 cm and length 25 cm. The gauge of the mesh was 800 microns. The device was placed in a Miele 756 FLA machine with a 3kg load of laundry on the economy main wash cycle at ambient temperature. This procedure was carried out 18 times.

Comparative Example A

In a control experiment, two identical tablets without the device were placed in the Miele 756 machine. The same washing procedure as in Example 1 was followed, again 18 times.

The incidence of tablet lodging in the machine door was as shown in the following table.

Table I

Example	Number of Tests	Average Number of Tablets Lodged
A	18	17
1	18	0

Claims

1. A device for dispensing one or more laundry treatment tablets in a washing machine, which device comprises a sleeve of elastic material, the sleeve when stretched being capable of conforming tightly to the tablet(s) and having holes which in the stretched state of the sleeve are sufficiently large to allow water flow therethrough.
2. A device according to claim 1 which has a degree of rigidity such that when containing a single tablet said device does not lodge in the door of washing machine.
3. A device according to claims 1 or 2 which is of substantially constant cross section.
4. A device according to any preceding claim which is made of a mesh network.

5. A device according to claim 4 in which the mesh is cross-linked such that it is expansible in width but relatively rigid in length.
- 5 6. A device according to claims 4 and 5 in which the holes are in the shape of a diamond.
7. A device according to claim 6 in which the length of the diamond when the device is empty ranges from 0.1 cm to 2.0 cm
- 10 8. A device according to any preceding claim which is made from a water insoluble elastic polymeric or polymer composite material.
9. A device according to any proceeding claim which is fabricated from plastics material.
10. A device according to any preceding claims which is capable of holding at least two tablets.
- 15 11. A device according to any preceding claims in which one end of the sleeve is sealed.
12. A device according to any preceding claim with at least one closure means.
- 20 13. A device according to any preceding claim which has a degree of rigidity such that when empty the device cannot pass between the inner and outer drum.
- 25 14. A method of treating fabrics in an automatic washing machine which comprises placing in with the fabrics laundry treatment tablets enclosed in a dispensing device comprising a sleeve of elastic material, the sleeve when stretched being capable of conforming tightly to the tablet(s) and having holes which in the stretched state are sufficiently large to allow water flow therethrough.

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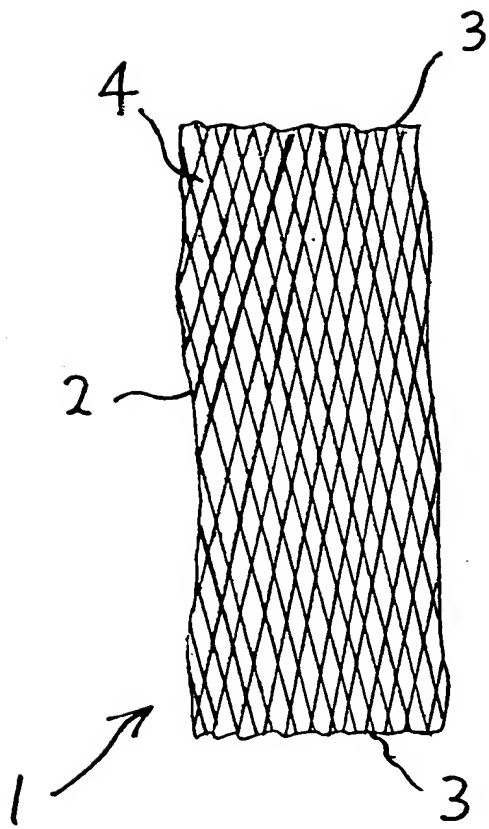


Fig. 1

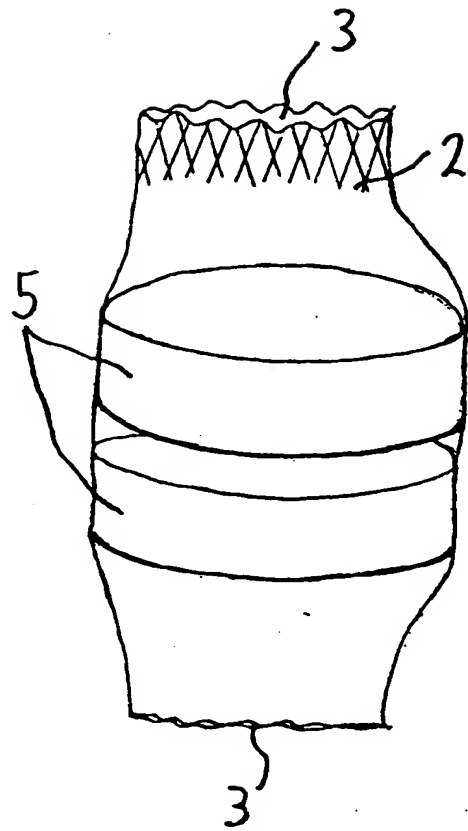


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number

EP 93 30 4824

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A,D	EP-A-0 343 069 (THE PROCTER & GAMBLE COMPANY) * column 5, line 23 - line 28; claims 1,6,7,12; figures 5,6 *	1-14	D06F39/02
A	EP-A-0 393 481 (HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN) * abstract; figures 1-12 *	1-14	
A,D	EP-A-0 473 532 (VIKING INDUSTRIES LIMITED) * column 4, line 30 - line 57; figures 3,4 *	1-14	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 SEPTEMBER 1993	Examiner COURRIER G.L.A.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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